

Claims 287-307 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Glazer et al. (US 5,646,264). The Examiner states the following:

Glazer discloses in Figure 4 the synthesis a heterodimeric dye composition comprising a first dye that comprises a phenanthridinium moiety and a second dye that is different from the first dye. The linker that links both dyes can comprise bromine or chlorine counter-ion.

Glazer does not show that the attachment is through the phenyl ring. Lee et al. disclose heterodimeric dye where the attachment is through a phenyl ring in ortho, meta or para position. See col.6, Tables 1-5.

Therefore it would have been obvious at the time the invention was made to synthesize heterodimeric dyes as taught by Glazer comprising an attachment via the phenyl ring as shown by Lee. The motivation is that the attachment is provided on a ring that is less steric and also viewed as an electrophilic moiety and more reactive toward nucleophilic moiety. It is well known in the art of organic chemistry that a phenyl ring comprising an electron withdrawing moiety such as the phenanthridinium moiety will be more reactive toward nucleophilic group and therefore can be substituted in ortho, meta or para position.

Applicants used the wrong Lee et al. reference in their response. The rejection was using the US Patent of Lee et al. 5,945,526, not the Nucleic Acids Research article (both cited in the PTO-1449). As it was shown in the office action, the rejection mentioned column 6 and Tables 1-5 which are not disclosed in the Nucleic Acids research article but they are clearly disclosed in the US patent 5,945,526.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Further Lee et al. disclose in

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Figures 9A + for example, results, which relate to energy transfer fluorescent dyes having enhanced fluorescence.

Applicants respectfully respond that this is not accurate. The features that Applicant relies are not provided in the rejected claim(s). The features that are described in the claim(s) are with regard to the position of the linkage to a second dye through the phenyl ring of the phenanthridinium moiety. The novel use of this position on the phenanthridinium moiety endowed the resultant molecule with surprising and unexpected properties. It was the search for new and useful properties that motivated the synthesis and testing of the novel dyes described in the patent application. Although the Lee et al. reference shows the attachment of two dyes through a phenyl group in column 6 and Tables 1-5, there is no use of a phenanthridinium dye in this reference and no indication that there any special advantages or properties are achieved by using the phenyl portion of the dyes as opposed to the fused ring portions of the dyes. As such, Lee provides no motivation for the use of the phenyl portion of the anthridinium molecules.

In terms of chemistry, there is no motivation to combine Lee and Glazer. The Examiner provides arguments that show that one could combine Glazer and Lee but fails to provide sufficient motivation about why one would do so. The Examiner states that a motivation would be that the ring was "less steric" and that the ring was "more reactive" towards a nucleophilic moiety. There are unlikely to be any steric problems in attaching a linker arm to the nitrogen atom of the fused ring compared to one of the carbon atoms of the phenyl ring and there is no evidence of any particular advantages in using the phenyl ring as opposed to carrying out a quarternization of the nitrogen in the ring. At the time of Glazer, reactions that could be used for attachment to a phenyl ring were well known and

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one would not even need familiarity with Lee et al., to understand that this synthetic route was available. However, it can be seen that although this method was available, Glazer chose not to use this method and quarternized the nitrogen atom. In a similar fashion, Applicants described the availability of two ethidium homodimers (EthD-1 and EthD-2) where again the ability to use the phenyl ring was long known but there was an apparent lack of motivation to use the phenyl ring instead of the nitrogen ring.

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SUMMARY

In view of the foregoing remarks, Applicants respectfully request reconsideration and withdrawal of the sole rejection of record of claims 287-307. Therefore, claims 287-307 are presented for further examination.

Early and favorable action is respectfully requested.

No other fee or fees are believed due in connection with this paper. In the event that any fee or fees are due, however, the United States Patent and Trademark Office is hereby authorized to charge any such fee or fees to Deposit Account No. 05-1135, or to credit any overpayment thereto.

If a telephone conversation would further the prosecution of the present application, Applicants' undersigned attorney requests that he be contacted at the number provided below.

Respectfully submitted,



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